

UNITED STATES INTELLIGENCE BOARD
COMMITTEE ON DOCUMENTATION

CODIB-D-107/3
19 August 1963

MEMORANDUM FOR: Inspector General of CIA

SUBJECT : CODIB Contribution on Objective 3

REFERENCE : Memorandum from DDCI, Subject: United States
Foreign Intelligence Objectives, Top Secret,
dated 8 July 1963

There are forwarded herewith 7 copies of a condensed version of the coordinated CODIB response on Objective 3 as submitted to you on 5 August 1963. The condensation was prepared in the office of the Chairman of CODIB. While it does not bear the approval of the member agencies in its present wording, it does not depart in substance from the most recent version developed by your steering committee. It is my view that the statement suffers some as a result of its having been coordinated, but short of coming up with some dissents, it is the best we can do.


Paul A. Borel
Chairman

Attachments

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Statement of Objectives

"That research be intensified to determine the usefulness of data processing techniques, including mechanized title or summary sentence permutation, to facilitate review and assessment of the great volume of material that must be dealt with in the intelligence community."

Programs and Plans for Action

A. The Problem in Perspective

1. As of today, only man possesses the intelligence and insight to ask questions, to exercise judgement, and to recognize a good solution when it turns up; the machine will never replace the intelligence analyst, but it can provide a powerful tool of analysis. Research and development work in intelligence automation is currently at a high level and is expected to increase in the years immediately ahead; the rate of progress, however, will be governed more by availability of first-rate research workers than by the supply of funds. And to further complicate the task, automation equipment is designed, essentially, to handle numerical data, while most intelligence ADP efforts are aimed at the much more difficult problem of programming non-numerical information processing.

2. Each USIB member agency has interest in, and is making continuing efforts to, improve its own information handling systems. Within DOD, these activities are coordinated and guided by the Director of Defense Research and Engineering; within the Intelligence Community the coordinating body is the USIB Committee on Documentation (CODIB), which in the recent past has been concerned with such specific problems as the compromising emanations of machines used in information handling, and such general interests as a Community survey of information processing capabilities.

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B. Operational and Development Program

1. Recently acquired mass collection techniques have produced volumes of electronic, photographic, acoustic and hard copy information beyond the processing capability of manual systems. Beginning in the early 1950's and steadily since, machine-support applications have been sought.

2. In the field of document storage and retrieval most intelligence organizations today operate machine supported systems tailored to their specific requirements. CIA indexes about 175,000 incoming items per year according to a comprehensive subject classification scheme developed by the Intelligence Community. The index records are controlled on punched cards and the hard copy is recorded on film mounted in aperture cards for easy access and reproduction. Air Force Intelligence in 1958 introduced a partially automated document storage and retrieval system (MINICARD) aimed at overcoming some of the basic limitations of punched cards in this field.

3. Currently, the Air Force, NSA, and the Department of State have major projects underway in the field of mechanized title or summary sentence permutation. The Air Force system called "Key Word in Context (KWIC) Indexing" seeks to combine key words into meaningful key terms as a basis for more effective indexing. The NSA experiment also provides for automatic capturing of the titles of reports as well as their permutation by computer. A pilot system under development by the Department of State in the area of Cuban affairs is being designed to produce permuted subject indexes for the analyst.

4. The CIA central information system currently is the subject of a major systems study to investigate the application of computers. The study is now completing an examination of analyst needs and is expected to proceed with detailed system design

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and implementation of initial segments over the next three years. The proposed system would cover all document sources of significance to the analyst, all categories of information (persons, organizations, places, things, subjects), and all geographic areas, with minimum handling during processing.

5. In the field of military intelligence support computers are providing essential services in the production of radar order-of-battle from ELINT; in the preparation of air, naval and ground forces order-of-battle; in following current air and merchant shipping activity; in compiling damage assessment information; in intelligence support to war gaming; and in performing various mathematical computations. Computers support to overhead reconnaissance has increased significantly during the past two years both in CIA and DIA in the following areas: (a) determining what to collect; (b) technical support of operations; (c) information and technical support of photographic interpretation.

6. All three military services and CIA have been sponsoring research in machine translation of foreign language documents. The present level of Government support to machine translation is about \$3 million annually. A Joint Advisory Group on Automatic Language Processing has been established to coordinate Government-supported machine translation research, evaluate its results, and guide its course in order to accelerate progress in this field.

7. CIA's WALNUT System is a large scale project for the employment of ADP in biographic intelligence support. Automated document storage and retrieval equipment has been installed, a sophisticated name-searching technique has been designed, and development of very large random access computer memory equipment to store the

entire biographic index is at an advanced stage. Development of a name tracing communications network in the Intelligence Community is under study.

D. Plans Under Development

1. Three areas of research posing special problems include:

a. **Conversion of Hard Copy to Machinable Form.** ADP application to the bulk of the huge historic data bases extant and to the volumes of current intelligence materials received will probably not occur until data conversion to machine language is realized. Solution of this problem, at least in large part, may well depend on development of an optical scanner to provide such conversion automatically; such development is underway.

b. **Development of Massive Random Access Memories.** The enormous quantities of intelligence have created a need for massive random access memories.

Present equipment is either too slow in processing rate or too limited in storage capacity; disc memories with multi-millionbit capacities are becoming available. A real breakthrough is required to achieve a multi-billion bit magnetic memory; DOD and others (USIB and non-USIB) have R&D money in this field.

c. **Non-numerical Intelligence Data Structuring and Processing.** The most promising non-numerical techniques are dependent, in varying degrees, on "associative memory techniques", under which concept, machine selection of information is by context rather than indexing location, thereby allowing all of the memory to be searched at one time. Little work to date has gone into such techniques; within the Community DOD has about \$1 million of FY 1964 funds marked for research in this area.

2. Shortage of ADP personnel is acute; this, itself, is a critical problem best tackled through the National Science Foundation which can influence university and specialized training programs. Steps to initiate action along this line will be taken with NSF.